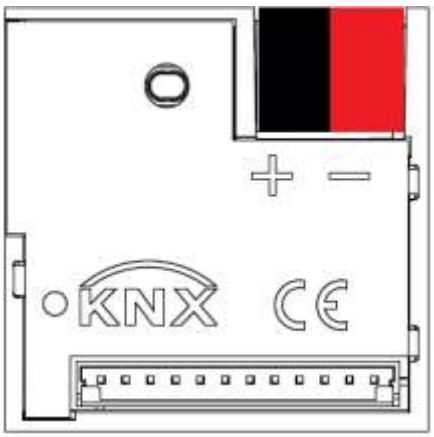
Product Handbook

IO22D01KNX	Inwall Module 2 Input / 2 Led Output
IO44D01KNX	Inwall Module 4 Input / 4Led Output
IO62D01KNX	Inwall Module 6 Input / 2 Led Output



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INDEX

Any information inside this manual can be changed without advice.

This handbook can be download freely from the website: *www.eelectron.com*

Exclusion of liability:
Despite checking that the contents of this document match the hardware and software, deviations cannot be completely excluded. We therefore cannot accept any liability for this.
Any necessary corrections will be incorporated into newer versions of this manual.

Symbol for relevant information 

Symbol for warning 

 DISPOSAL : The crossed-out bin symbol on the equipment or packaging means the product mustnot be included with other general waste at the end of its working life. The user musttake the worn product to a sorted waste centre, or return it to the retailer when purchasing anew one. An efficient sorted waste collection for theenvironmentally friendly disposal of the useddevice, or its subsequent recycling, helps avoid the potential negative effects on the environmentand people's health, and encourages the re-use and/or recycling of the construction materials

1. General introduction

This manual is intended for use by KNX® installers and describes functions and parameters of the IO22D01KNX, IO44D01KNX and IO62D01KNX modules and how you can change settings and configurations using the ETS software tool.
The IO22D01KNX, IO44D01KNX and IO62D01KNX devices are a inwall modules with 2,4,6 inputs and 2 or 4 LED outputs.
The inputs are for dry contacts (free from potential); the outputs can drive low voltage LEDs; use high efficiency LED cod. eelectron LD00A01ACC (blue) or LD00A11ACC (white).
The IOxxD01KNX module is designed for use in domestic and building installations (eg offices, hotels, private homes, etc.)..

2. Product overview

Main functions inputs

Digital inputs can be connected to buttons or switches and can be used for:

- 1-bit commands: loads activation / deactivation commands (ON / OFF / TOGGLE) with short pressure or with long and short pressure differentiation
- 1 byte commands (0-255 or HVAC commands or % value commands).
- Sending long action telegrams to the same short action address or to a different group address
- Commands for cyclicsending
- Sequences (3 commands that mix 1 bit / 1 byte objects) with different group addresses - in short and long press mode or in switching mode
- Dimmer management (with single button or with double button)
- Roller shutters and blinds management (with single button or with double button)
- Control sequences with 1 bit to manage switching on / off lights or rows of lights
- Input counters (only inputs from 1 to 5)

Logic functions

- 2 input object and 1 output obj for every logic
- Delay, retransmission of telegrams
- NOT / AND / OR / NAND / NOR / XOR / XNOR
- Bit to Byte conversion
- Byte to Bit conversion
- 1,2,4 Bytes Threshold

3. Installation instructions

The device may be used for permanent indoor installations in dry locations within wall box mounts.

WARNING

- Device must be installed keeping a minimum distance of 4 mm between electrical power line (mains) and input cables or red / black bus cable.
- The device must not be connected to 230V cables
- The prevailing safety rules must be heeded.
- The device must be mounted and commissioned by an authorized installer.
- The applicable safety and accident prevention regulations must be observed.
- The device must not be opened. Any faulty devices should be returned to manufacturer.
- For planning and construction of electric installations, the relevant guidelines, regulations and standards of the respective country are to be considered.
- KNX bus allows you to remotely send commands to the system actuators. Always make sure that the execution of remote commands do not lead to hazardous situations, and that the user always has a warning about which commands can be activated remotely.

For further information please visit:www.eelectron.com

4. Parametri Generali

KNX PARAMETER	SETTINGS
Delay on Power-up	5 ÷ 15 seconds
Through this parameter is possible to set the delay of transmission of telegrams after a power on by selecting the time by which the device is allowed to send telegrams. In large systems after a power failure or shutdown this delay avoids to generate excessive traffic on the bus, causing slow performance or a transmission block. If there are different devices requiring sending telegrams on the bus after a reset, these delays must be programmed to prevent traffic congestion during the initialization phase. The input detection and the values of objects are updated at the end of the transmission delay time At the end of ETS programming the device behaves like after a power on.	

5. Digital inputs

Each individual input can be configured to perform one of the following functions:

- Activation on press
- Activation on press / release
- Activation on short and long press
- Dimming
- Shutter and blinds
- Scene
- Command sequences (short and long press)
- Command sequences (toggle function)
- Command sequences 1 bit
- Input counter (pulse counter)

Activation on press

"Activation on press" allows you to configure the sending of telegrams when the button is pressed; device can also be configured to send periodic messages with repetition period.

KNX PARAMETER	SETTINGS
Telegram Associated	1 bit / 1 byte
It is possible to send 1 bit or 1 byte objects	

Configurations for 1 bit object:
On
Off
Toggle

Configurations for 1 byte object:
Value 0-255 (generic signed int)
Value 0-100% (scaling value in steps of 5%)
HVAC Mode (DPT_HVACMode 20.102)

KNX PARAMETER	SETTINGS
Cyclicsending when button pressed	Never 0.3 sec. 0.4 sec. 0.5 sec. 0.8 sec 1.0 sec. 1.2 sec. 1.5 sec. 2.0 sec. 3.0 sec. 5.0 sec. 8.0 sec. 10 sec.
As long as the button is pressed, the telegram with selected size and value is sent cyclically; this parameters defines the time interval between two sendings	

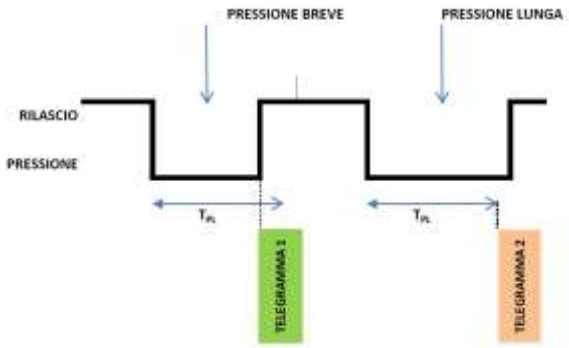
Activation on press / release

"Activation on press / release " allows you to configure the sending of telegrams when the button is pressed and when it is released.
Parameters are identical to the choice "activation on press"; one parameter is added:

KNX PARAMETER	SETTINGS
Communication object on release	disabled / enabled
if enabled, this parameter displays an additional communication object (<Button x> Release Action) that is transmitted on the release event, this object can be associated with a group address other than the one that sends the value associated with the pressure.	

Activation on short and long press

The different duration between short and long press is defined by the parameter "Minimum time long press button".
You can set to send a telegrams with different values on short and long press or decide to send commands only on one of this events.



When button is pressed then counting time starts; if the button is released before time exceeds TPL time, device executes the command associated with the event of "short press" and if, on the contrary, TPL timeout expires and button is still pressed then the command associated with the event of "long press" is executed.
The parameters and mode of transmission of telegrams can be managed through "activation on long and short press" are the same set with the configuration "Activation of press / release " except for the function of cyclic sending that is not provided here.

Dimming

Through the dimming function it's possible to control a light dimmer using short and long press of the buttons.
Each button uses 2 communication objects:
1 bit dimension for ON /OFF command associated to short press operation
4 bit dimension for brightness regulation associated to long press operation

Parameter "Minimum time long press button" can set the minimum duration of long press; "Dimming mode" and "Dimming step" can define brighter or darker behaviour and step of each long press action.

Shutter and Blinds

Through the Shutter and Blind function it's possible to control Roller Shutters or Blinds using short and long press of the buttons.
Each input uses 2 communication objects:

1 bit dimension for STEP /STOP command associated to short press operation
1 bit dimension for UP / DOWN command associated to long press operation

Parameter "Minimum time long press button" can set the minimum duration of long press; "Command drive shutter" can define up or down behaviour associated to long press action.

Scene

In this configuration page it's possible to set the button for scene management: learn and recall scene commands.
These different behaviour (recall and learn) are performed through two different actions (short and long press) of the button.

Learn scene on long press action is enabled by a parameter; "Minimum time long press button" can set the minimum duration of long press.

KNX PARAMETER	SETTINGS
Scene Number	Number of the scene: 0 ÷ 63
This parameter sets the value of the scene you intend to learn / recall (one per channel). Remember that output devices (i.e. actuators, etc.) generally can manage several scenes, each identified by a value (that varies from 0 to 63); therefore is important to set this parameter correctly and matching the number set on the actuators.	
Store scene on long press	disabled / enabled
If disable, long press action is ignored and no telegram is sent to the bus; if enable on long press action a learn scene telegram is sent to the bus.	
Object enable scene learning from bus	disabled / enabled
If this parameter is enabled you have a communication object (size = 1 bit) in order to enable / disable runtime from bus the sending of the "learn scene telegram". When this object receives a telegram "1" then the function associated to the long press of the button (send the telegram storage scenario) is enabled, when it receives a telegram "0" the command associated with the long press is not sent.	

Commands sequences

This function allows you to associate to short and long press, sequences of different commands on the bus.
For each button this function is available for short and long press or as toggle function.
The sequence consists of 2 or 3 commands which can each be sized as 1 bit or 1 byte.
Once defined the number of elements in the sequence (2 or 3) and their size (1-bit / 1 byte), you can associate different commands to each element of the sequence or decide to send commands only on one of the two events.
The waiting time between a command and the next is fixed in 1 second.
Each object communication can be connected to a different group address.

For example it is possible to define a sequence:

obj	dimension	short press (operation 1)	long press (operation 2)
A	1 bit	ON (to actuators)	OFF (to actuators)
B	1 byte	100% (to a dimmer)	0% (to a dimmer)
C	1 byte	COMFORT (to a thermostat)	ECONOMY (to a thermostat)

Command sequences(1 bit)

This function allows you to send sequences of 1-bit commands to multiple objects. The sequence can be defined on 2 or 3 objects. Each time the switch/button connected to the input is pressed, the next step of the defined sequence is sent.

KNX PARAMETER	SETTINGS
Number of objetcs	2, 3
This parameter defines the number of 1-bit objects that will be visible and will send values 0 or 1 on the bus	
Numberof steps in the sequence	2 ÷ 8
Indicates the number of steps of which the sequence is made up.	
Long press ti restart sequence	disabled/enabled
Allows to associate to a long pressure of the switch/button connected to input channel an action of "restart" of the sequence.	
Restart function	Restart and send first Send long step and restart
Restart and send first The long press determines the sending of step 1	

Send long step and restart The long press determines the sending of the next step and brings the sequence to the initial step.	
Send only changed objects	disabled/enabled
This parameter defines whether, in the transition from one step to the next, all values associated with single-bit objects or only those that change are to be sent.	
Value step <x>	*On and off combinations on 2 or 3 1-bit objects*
Determines the combination associated with a sequence using 2 or 3 1-bit objects.	

Input counter (pulse counter)

Using the Input Counter function it is possible to count the pulses of a contact connected to the input. It is possible to define the size of the counter (1,2 or 4 Bytes), the initial value and the final value. It is possible to associate the sending of a value with 1 bit or 1 byte each time the counter reaches the final value (overflow). the counter can be reset by an writing on a dedicated 1-bit object.
Using the "Condition of increase counter" parameter, you choose whether to count only the rising, falling or both edges.
The parameter "Software filter frequency " allows to manage a software filter that allows to count 2 pulses too close each other as a single impulse; this is necessary when the contact connected to the input has a debounce for a certain time.

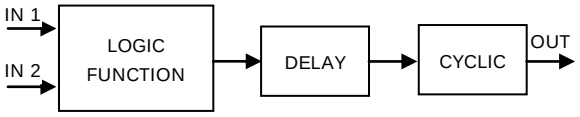
6. Led output

Each output can be connected to a LED (see LED eelectron code LD00A01ACC / LD00A11ACC) and configured as:

Always OFF	Led is OFF
Always ON	Led is ON
Bus controlled	Led is lit on or off upon the telegram receive from bus ; initial state and led behaviour (fixed or blink) can be configured

7. Logics

The logic functions are organized into groups of 3 objects: 2 inputs and 1 output, except the one called "logic expression" that will be described later. The scheme of logics is as follows:



Inputs
Input datatypes can be bit, byte, float etc according to the selected logic.
IN1 is always present. IN2 maybe unused (or hidden directly by ETS).

Delay
The logic output can be delayed according to the ETS parameter, if a new value is received, the output is overwritten and the delay reset.

Cyclic
The delayed output can be retransmitted n times according to ETS parameters

Logic function
Logic function type is defined by an ETS parameter; here the list of functions:

FUNCTION NAME	DESCRIPTION
Disabled	The logic block is disabled, no parameter / object is visible.
bit no transfer	Only delay and retransmission. IN1 is a bit. IN2 is disabled. OUT is a bit.
byte no transfer	Only delay and retransmission. IN1 is a byte. IN2 is disabled. OUT is a byte.
bit NOT	OUT = NOT IN1 IN1 is a bit. IN2 is disabled. OUT is a bit.
bit AND	OUT = IN1 AND IN2 IN1 is a bit IN2 is a bit OUT is a bit.
bit OR	OUT = IN1 OR IN2 IN1 is a bit IN2 is a bit OUT is a bit.
bit NAND	OUT = NOT (IN1 AND IN2) IN1 is a bit IN2 is a bit OUT is a bit.
bit NOR	OUT = NOT (IN1 OR IN2) IN1 is a bit IN2 is a bit OUT is a bit.
bit XOR	OUT = IN1 XOR IN2 IN1 is a bit IN2 is a bit OUT is a bit.
bit XNOR	OUT = NOT (IN1 XOR IN2) IN1 is a bit IN2 is a bit OUT is a bit.
bit to byte conversion	2 ETS parameters: BYTE_0, BYTE_1. When 0 is received, BYTE_0 is sent. When 1 is received, BYTE_1 is sent. IN1 is a bit. IN2 is disabled. OUT is a byte.
byte to bit conversion	1 ETS parameter: BYTE_V. When a value equal to BYTE_V is received then a telegram 0,1, or nothing is sent. When a value different from BYTE_V is received then a telegram 0,1, or nothing is sent IN1 is a byte. IN2 is disabled. OUT is a bit.
byte threshold	1 ETS parameter: BYTE_V. When a value less or equal to BYTE_V is received then a telegram 0,1, or nothing is sent. When a value greater than BYTE_V is received then a telegram 0,1, or nothing is sent IN1 is a byte. IN2 is disabled. OUT is a bit.
2 byte float threshold	1 ETS parameter: 2BYTE_F. When a value less or equal to 2BYTE_F is received then a telegram 0,1, or nothing is sent. When a value greater than 2BYTE_F is received then a telegram 0,1, or nothing is sent IN1 is a 2 bytes float. IN2 is disabled. OUT is a bit.
4 byte float threshold	1 ETS parameter: 4BYTE_F. When a value less or equal to 4BYTE_F is received then a telegram 0,1, or nothing is sent. When a value greater than 4BYTE_F is received then a telegram 0,1, or nothing is sent IN1 is a 4 bytes float. IN2 is disabled. OUT is a bit.